

WHAT IS CLAIMED IS:

- 1 Substant
1. A computer program product for a system including a processor  
2 comprises:  
3 a tangible memory coupled to the processor including:  
4 code that directs the processor to determine an output resolution for an  
5 output stream of data;  
6 code that directs the processor to determine an output frame rate for the  
7 output stream of data;  
8 code that directs the processor to determine an output color depth for  
9 the output stream of data;  
10 code that directs the processor to retrieve a first frame of data, a second  
11 frame of data, and a third frame of data from an input stream of data, the input stream of data  
12 having an input resolution, an input frame rate, and an input color depth;  
13 code that directs the processor to subsample the first frame of data, the  
14 second frame of data, and the third frame of data to respectively form a first subsampled  
15 frame of data, a second subsampled frame of data, and a third subsampled frame of data,  
16 when the output resolution is lower than the input resolution;  
17 code that directs the processor to remove the second subsampled frame  
18 of data, when the output frame rate is lower than the input frame rate;  
19 code that directs the processor to reduce color depth for the first  
20 subsampled frame of data and the second subsampled frame of data to respectively form a  
21 first reduced frame of data and a second reduced frame of data, when the output color depth  
22 is smaller than the input color depth; and  
23 code that directs the processor to convert the first reduced frame of  
24 data and the second reduced frame of data into the output stream of data.
- 1           2. The computer program product of claim 1 wherein the tangible  
2 memory further comprises:  
3 code that directs the processor to determine an output bit rate for the output  
4 stream of data; and  
5 code that directs the processor to scale the first reduced frame of data and the  
6 second reduced frame of data, in response to the output bit rate for the output stream of data

1               3.     The computer program product of claim 1 wherein the output stream of  
2 data is in a format selected from the group consisting: MPEG-1, MPEG-2, MPEG-4, jpeg,  
3 gif, wbmp.

1               4.     The computer program product of claim 1 wherein the output stream of  
2 data is in a format selected from the group consisting: \*.avi, \*.rm, \*.mov.

1               5.     The computer program product of claim 1 wherein the output  
2 resolution is a multiple of a frame having a resolution of approximately 80 horizontal pixels  
3 by approximately 60 vertical pixels.

1               6.     The computer program product of claim 1 wherein the output  
2 resolution is a multiple of 8 horizontal pixels.

1               7.     The computer program product of claim 1 wherein the tangible  
2 memory further comprises:

3               code that directs the processor to crop the first frame of data, the second frame  
4 of data, and the third frame of data before subsampling.

1               8.     A program product for a processor comprises:  
2               code that directs the processor to receive a specification of a resolution, a  
3 frame rate, a color depth, and format for the output video stream;  
4               code that directs the processor to receive a specification of a resolution, a  
5 frame rate, and a color depth, for the input video stream;  
6               code that directs the processor to receive a plurality of video frames from an  
7 input video stream;

8               code that directs the processor to subsampling each video frame from the  
9 plurality of video frames, when the resolution for the output video stream is different from  
10 the resolution of the input video stream;

11              code that directs the processor to drop video frames from the plurality of video  
12 frames, when the frame rate for the output video stream is different from the frame rate of the  
13 input video stream;

14              code that directs the processor to reduce color depth for video frames from the  
15 plurality of video frames, when the color depth for the output video stream is different from  
16 the color depth of the input video stream; and

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17 code that directs the processor to convert the plurality of video frames to the  
18 output video stream in response to the format for the output video stream;  
19 wherein the codes reside on a tangible media.

1 9. The program product of claim 8 further comprising  
2 code that directs the processor to receive a specification of a bit rate for the  
3 output video stream; and  
4 code that directs the processor to determine scaling factors for the plurality of  
5 video frames; and  
6 code that directs the processor to scale the plurality of video frames by the  
7 scaling factors.

1 10. The program product of claim 8 wherein the format for the output  
2 video stream comprises an MPEG standard.

1 11. The program product of claim 8 wherein the format for the output  
2 video stream comprises a streaming video format.

1 12. The program product of claim 8 wherein the resolution for the output  
2 video stream is a rational multiple of the resolution for the input video stream.

1 13. The program product of claim 8 the code that directs the processor to  
2 reduce color depth for video frames from the plurality of video frames is executed before the  
3 code that directs the processor to subsample each video frame from the plurality of video  
4 frames.

1 14. The program product of claim 8 wherein the format for the input video  
2 stream comprises data from a file.

1 15. The program product of claim 9 wherein the bit rate for the output  
2 video stream is greater than or equal to approximately 38 kilobits per second.

1 16. A program product for a processor for dynamically reducing  
2 bandwidth of an input video stream to meet bandwidth requirements for an output video  
3 stream comprises:  
4 code configured to direct the processor to receive frames of data derived from  
5 the input video stream;

6 code configured to direct the processor to receive bandwidth requirements for  
7 the output video stream, and an encoding format for the output video stream;  
8 code configured to direct the processor to reduce bandwidth used by the  
9 frames of data in response to the bandwidth requirements; and  
10 code configured to direct a processor to encode bandwidth reduced frames of  
11 data to form the output video stream in the encoding format;  
12 wherein the codes reside on a tangible media.

1 17. The program product of claim 16  
2 wherein bandwidth requirements comprise spatial bandwidth; and  
3 wherein the code configured to direct the processor to reduce bandwidth used  
4 by the frames of data comprises code configured to direct the processor to reduce spatial  
5 bandwidth used by the frames of data in response to the spatial bandwidth requirements.

1 18. The program product of claim 17 wherein code configured to direct the  
2 processor to reducing spatial bandwidth comprises code configured to direct the processor to  
3 subsample the frames of data.

1 19. The program product of claim 16  
2 wherein bandwidth requirements comprise color bandwidth; and  
3 wherein the code configured to direct the processor to reduce bandwidth used  
4 by the frames of data comprises code configured to direct the processor to reduce color  
5 bandwidth used by the frames of data in response to the color bandwidth requirements.

1 20. The program product of claim 19 wherein code configured to direct the  
2 processor to reducing color bandwidth comprises code configured to direct the processor to  
3 reduce a bit depth of the frames of data.

1 21. The program product of claim 16  
2 wherein bandwidth requirements comprise frame rate; and  
3 wherein the code configured to direct the processor to reduce bandwidth used  
4 by the frames of data comprises code configured to direct the processor to reduce frame rate  
5 of the frames of data in response to the frame rate requirements.

1           22. The program product of claim 21 wherein code configured to direct  
2 the processor to reducing frame rate comprises code configured to direct the processor to  
3 eliminate frames from the frames of data.